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Case report

Suicide attempts involving power drills

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ABSTRACT

A 61-year-old man was found dead next to a power drill soiled with blood and bone dust. A 5 mm circular wound of the forehead corresponded to the size of the drill bit. Subarachnoid haemorrhage was present over the anterior pole of the left frontal lobe with a penetrating injury extending 75 mm into the frontal lobe white matter towards, but not involving, the basal ganglia. No major intracranial vessels had been injured and there was no significant intraparenchymal haemorrhage. Death was due to haemorrhage from self-inflicted stab wounds to the abdomen with an associated penetrating intracranial wound from a power drill. Deaths due to power drills are rare and are either accidents or suicides. Wounds caused by power drills may be mistaken for bullet entrance wounds, and the marks around a wound from the drill chuck as muzzle imprints. A lack of internal bevelling helps to distinguish the entrance wound from that due to a projectile. Significant penetration of the brain may occur without lethal injury.
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1. Introduction

Penetrating injuries of the cranial cavity in civilian settings most often involve gunshot wounds, with the frequency depending on the jurisdiction and the availability of weapons,[1] and motor vehicle accidents. Gunshot wounds to the head may be an indicator of an accident, a homicide or a suicide, and this may only be clarified once the death scene and autopsy findings have been evaluated. Accidental penetration of the head may be influenced by age, with infants and toddlers being more vulnerable due to incomplete fusion of skull bones that are separated by fibrous fontanelles.[2,3] The following case demonstrates another rare cause of intracranial penetration in which an electric power drill was used in a suicide.

2. Case report

A 61-year-old man was found dead at his home address lying on a garden seat. Next to the body was a power drill with a drill bit in the chuck soiled with blood and white powder which appeared to be bone dust (Fig. 1). On examination there was a circular wound of the forehead slightly to the left of midline measuring approximately 5 mm in diameter (Fig. 2). In addition there were two superficial incised wounds of the left arm measuring 13 and 25 mm respectively, and four stab wounds of the left upper quadrant of the abdomen, each measuring approximately 13 mm in length. A vegetable knife was located at the scene. Prior to autopsy an X-ray of the head revealed a single circular defect in the left frontal bone immediately beneath the surface wound.

At autopsy the most serious injuries were the stab wounds to the upper abdomen, one of which had penetrated the anterior aspect of the spleen. Blood clot was adherent to the spleen with approximately two litres of fluid and clotted blood within the peritoneal cavity. There had also been penetration of the anterior wall of the transverse colon. The scalp defect was surrounded by a small amount of subgaleal haematoma with a drilled hole in the underlying frontal bone that showed no bevelling. Subarachnoid haemorrhage was present over the anterior pole of the left frontal lobe with a penetrating injury extending 75 mm into the frontal lobe white matter towards, but not involving, the basal ganglia (Fig. 3). No major vessels had been injured and there was no significant intraparenchymal haemorrhage. No other significant injuries were noted, and there was no involvement of major vessels by the arm wounds. There were also no injuries to suggest an assault and no defence-type wounds. Microscopic examination of clot and adjacent tissue from the abdomen revealed an established vital reaction with a neutrophil infiltrate. Apart from focal areas of myocardial scarring, there were no underlying organic diseases which could have caused or contributed to death. Death was attributed to haemorrhage from self-inflicted stab wounds to the abdomen with an associated penetrating intracranial wound from a power drill. No information on the recent psychological status of the decedent was available.

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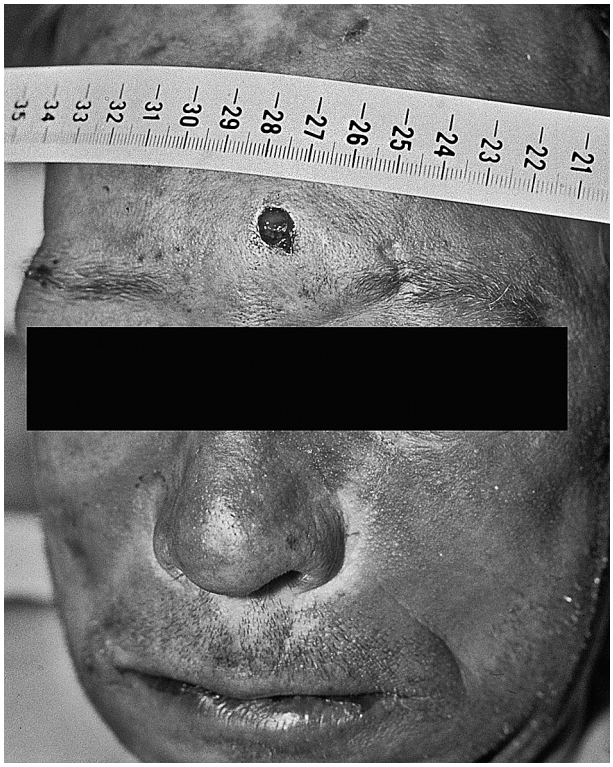

Fig. 1. A power drill used in a suicide attempt with a drill bit in the chuck soiled with blood and bone dust.

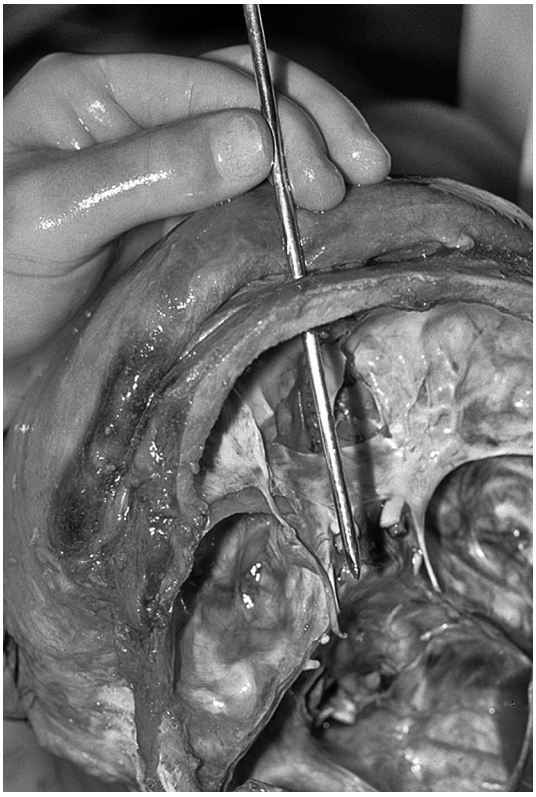

Fig. 2. A circular wound of the forehead slightly to the left of midline measuring 5 mm in diameter overlying a drilled hole in the frontal bone.

3. Discussion

Methods of suicide vary greatly depending on the community, with the most common methods utilized in Australia and in a number of Western countries being hanging, carbon monoxide poisoning and shooting.[4] Factors guiding the preferred method of self destruction, however, are availability and an understanding of the lethal consequences[5]; for example, insecticide overdose may be more common method used in poor rural communities, compared to jumping from tall buildings that occurs more often in urban settings.

Suicide involving cranial vault penetration without a firearm is unusual. Probably the most "common" methods have involved the use of industrial nail or captive-bolt guns,[6–8] although rare cases have been reported of suicide attempts with crossbows,[9] or where nails have been manually hammered into a victim's head.[10,11] There may be a history of significant psychiatric illness, as was reported in a 34-year-old male with manic depressive psychosis who died after he had driven an awl into his brain.[12] Other implements that have caused penetrating brain trauma include ice picks, keys, chopsticks, pencils, knives, screwdrivers, needles, ballpoint pens and metal wire.[13,14] On occasion a reverse mechanism may be used whereby the head is rested on a metal spike and is driven downwards by a weight dropping onto it.[15]

Deaths caused by power drills are exceedingly rare and are primarily accidents or suicides. Accidents may occur when a worker has fallen while using an electric drill which does not automatically turn off.[16] Only a handful of cases where a power drill has been used in a suicide attempt have been reported, despite their ready availability, and this has been mainly in the non-English literature.[17–19] One of the issues that was demonstrated in the current case, is that self-inflicted power drill injuries are not necessarily fatal[13]; i.e. despite deep penetration of the brain in this case, no lethal intracranial injuries were sustained and death occurred instead from stab wounds to the abdomen. In other reports the sites of injury from power drills have included the chest and head with some victims manifesting injuries at both locations.[17,20]

Potential diagnostic problems that may arise in evaluating the wounds caused by power drills include mistaking the skin wound for a bullet entrance wound and misinterpreting the marks surrounding the wound left by the drill chuck as muzzle imprints.[21] The absence of internal bevelling with the features of a drilled hole in the described case helped to distinguish the entrance wound from that due to a projectile. The case also demonstrates that significant

Fig. 3. After removal of the brain a probe inserted through the drill hole demonstrated the direction of the drill bit: i.e. from front to back, horizontal and slightly to the left.

penetration of the brain may be achieved in a suicide attempt without sustaining lethal injury. The presence of incised wounds to the arm and localized stab wounds to the abdomen, in the absence of signs of assault and defence injuries was in keeping with a complex suicide, defined as .a suicide in which more than one method is used either simultaneously or successively.[22,23]

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Conflict of interest

None.

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